

# Ru-S (Ruthenium-Sulfur)

H. Okamoto

RuS<sub>2</sub> is the only stable phase in the Ru-S system [33Juz]. [89Bry] determined the Ru-RuS<sub>2</sub> partial phase diagram (Fig. 1) by DTA, X-ray, and metallography. The L ↔ (Ru) + Ru<sub>2</sub>S eutectic is 50.3 at.% S and 1440 °C. The crystal structure of RuS<sub>2</sub> (Table 1) was reported by [27Jon]. Lattice parameter data are given in Table 2.

## Cited References

**27Jon:** W.F. de Jong and A. Hoog, *Rec. Trav. Chim.*, **46**, 173-176 (1927).  
**28Ban:** F.A. Bannister and M.H. Hey, *Mineralog. Mag.*, **23**, 188-206 (1928); quoted in [Hansen].

**28Of:** I. Oftedal, *Z. Phys. Chem.*, **135**, 291-299 (1928) in German.

**33Juz:** R. Juza and W. Meyer, *Z. Anorg. Chem.*, **213**, 273-282 (1933) in German.

**63Kno:** O. Knop, *Can. J. Chem.*, **41**, 1832-1833 (1963).

**67Sut:** Sutarno, O. Knop, and K.I.G. Reid, *Can. J. Chem.*, **45**, 1391-1400 (1967).

**89Bry:** V.A. Bryukvin, N.M. Pavlyuchenko, N.V. Blagoveshchenskaya, and B.A. Fishman, *Izv. Akad. Nauk SSSR, Met.*, (5), 28-30 (1989) in Russian; TR: *Russ. Metall.*, (5), 22-24 (1989).

Table 1 Ru-S Crystal Structure Data

| Phase            | Composition, at.% S | Pearson symbol | Space group               | Strukturbericht designation | Prototype                 |
|------------------|---------------------|----------------|---------------------------|-----------------------------|---------------------------|
| (Ru)             | 0                   | <i>hP2</i>     | <i>P6<sub>3</sub>/mmc</i> | A3                          | Mg                        |
| RuS <sub>2</sub> | 66.7                | <i>cP12</i>    | <i>Pa3</i>                | C2                          | Fe <sub>2</sub> S(pyrite) |
| (αS)             | 100                 | <i>oF128</i>   | <i>Fddd</i>               | A16                         | αS                        |

Table 2 Ru-S Lattice Parameter Data

| Phase            | Composition, at.% S | Lattice parameters, nm |          |          | Reference    |
|------------------|---------------------|------------------------|----------|----------|--------------|
|                  |                     | <i>a</i>               | <i>b</i> | <i>c</i> |              |
| Ru               | 0                   | 0.27058                | ...      | 0.42816  | [Massalski2] |
| RuS <sub>2</sub> | 33.3                | 0.5612                 | ...      | ...      | [27Jon]      |
|                  |                     | 0.560                  | ...      | ...      | [28Ban]      |
|                  |                     | 0.558                  | ...      | ...      | [28Of]       |
|                  |                     | 0.56103                | ...      | ...      | [63Kno]      |
|                  |                     | 0.56059                | ...      | ...      | [67Sut]      |
| αS               | 100                 | 1.0464                 | 1.28660  | 2.44860  | [Massalski2] |

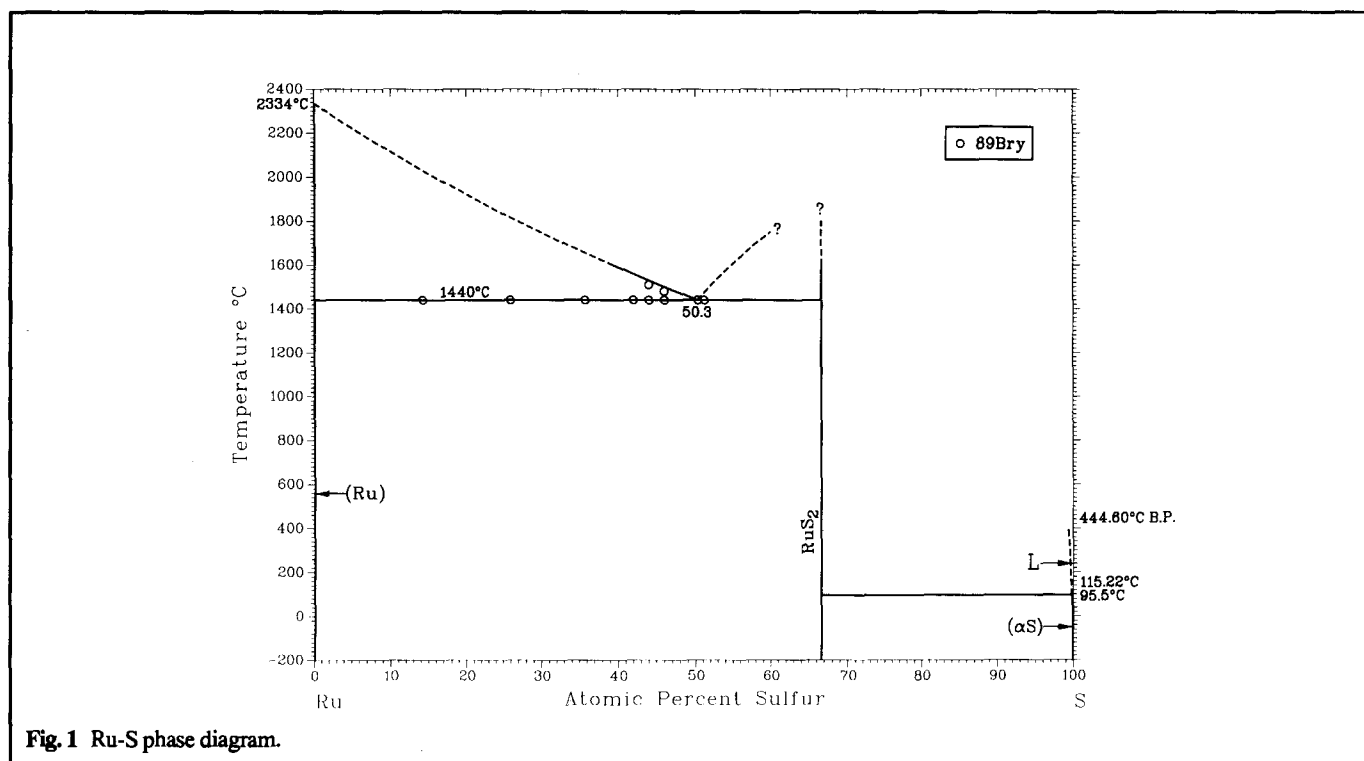


Fig. 1 Ru-S phase diagram.